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10/662,969	09/15/2003	Trevor MacDougall	WEAT/0414	1106
36735 7590 08/16/2007 PATTERSON & SHERIDAN, L.L.P. 3040 POST OAK BOULEVARD, SUITE 1500 HOUSTON, TX 77056			EXAMINER LIU, LI	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/662,969

Applicant(s)

MACDOUGALL ET AL.

Examiner

Li Liu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,6,8-12,14,16-22 and 26-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6,8-12,14,16-22 and 26-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on 6/16/2007 with respect to claims 1, 11 and 21 have been fully considered but they are not persuasive, and moot in view of the new ground(s) of rejection. The examiner has thoroughly reviewed Applicant's arguments but firmly believes that the cited reference reasonably and properly meet the claimed limitation as rejected.

1). Applicant's argument – "The Examiner argues that *Cooper et al.* uses gating to remove periodic noise from the electrical signals. However, the gating used by *Cooper et al.* is time based, whereas the gating of the present invention is based on frequency. The other references cited by the Examiner cannot overcome this deficiency."

Examiner's response – Davis uses spectral analysis to analyze the noise; and *Cooper et al* discloses that the noise reduction system performs a frequency analysis of the electrical signals and removes the periodic noise from the electrical signals by gating the periodic noise out of the electrical signals. Although *Cooper et al* does not expressly disclose that the periodic noise from the noise producing element is removed using frequency based gating. The time and frequency are a complimentary pair; $h(t)$ in time domain and $H(f)$ in frequency domain are two different representations of the same function. One can go back and forth between these two representations by means of the Fourier transform. That is, if the noise can be gated out in time domain, it also can be gated out in the frequency domain. The frequency based gating is well known in the

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art, and the cited prior, Wang et al, discloses a system and method that uses Fast Fourier Transform technique to analyze the periodic noise of an electrical signal and remove the periodic noise from the electrical signals using frequency based gating (Abstract, Figures 2 and 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the frequency analysis and noise gating as taught by Wang et al to the system of Davis and Cooper so that the noise can be efficiently identified and removed or gated out of the electrical signals, and measurement accuracy can be enhanced.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

1). Misnumbered claim 33 should be renumbered as claim 32, and has been treated as such for the remainder of this Office action.

2). Misnumbered claim 34 should be renumbered as claim 33, and has been treated as such for the remainder of this Office action.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 6, 8-11, 14, 18-21 and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (US 6,346,702) in view of Cooper et al (US 2002/0025097) and Wang et al (Wang et al: "Analysis and Suppression of Continuous Periodic Interference for On-Line PD Monitoring of Power Transformers", High Voltage Engineering Symposium, 22-27 August 1999, 5.212.P5).

1). With regard to claims 1, 6 and 28-30, Davis discloses an optical system (Figure 2B) comprising:

a source (BROADBAND SOURCE 12 in Figure 2B) for producing optical signals;
an optical waveguide (Form the coupler 14 to FBG 18 in Figure 2B) having a noise producing element (connectors, splicers or imperfections in the FBG itself, column 1 line 40-41) and an optical filter element (the FBG 16 or 18 in Figure 2B);

a receiver for (20 in Figure 2B) converting applied optical signals into electrical signals;

a coupler (14 in Figure 2B) for coupling said produced optical signals into said optical waveguide and for coupling reflections from said noise producing element and from said optical filter element to said receiver (20 in Figure 2B) as applied optical signals (column 3 line 59-64); and

a noise reduction system (the combination of 32 and 34 in Figure 2B) for removing noise produced by said noise producing element from said electrical signals (column 4 line 16-67).

Davis uses spectral analysis to analysis noise (32 and 34 in Figure 2B, and Figure 3 and 4) and a variable threshold is used to remove the background noise; and removing noise includes performing a frequency analysis (34 in Figure 2B is the spectral analysis device).

But Davis does not expressly disclose (A) wherein a periodic noise from said noise producing element is removed using frequency based gating; (B) the frequency analysis is a Fourier analysis (claim 6); (C) wherein the noise reduction system performs a frequency analysis of the electrical signals to identify periodic noise (claim 28); (D) wherein the frequency based gating comprises of selecting a bandwidth where periodic noise has been identified and removing the bandwidth from the electrical signals (claim 29); and (E) wherein the noise reduction system identifies periodic noise by identifying a rapidly varying signal from the frequency analysis (claim 30).

With regard to items (C)-(E), however, Cooper et al discloses a system in which the noise reduction system (20 in Figure 2 and 7) performs a frequency analysis (a standard optical spectrum analyzer, [0071]) of the received signals to identify and further removes the noise from the optical signals. Cooper et al uses the frequency analysis and gating method to obtain a specific frequency and remove unwanted other frequency (Figure 4A – Figure 4C, [0071]). Although Cooper et al does not expressly state that the other frequency (e.g. the peak just on the left side of the 1553.4 nm in

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Figure 4A, which is shown in Figure 4C) is a "periodic noise", that peak is indeed a "noise" relative to the specific frequency component 1553.4 nm which is shown in Figure 4B; and since this "noise" is generated by another FBG, it is indeed a "periodic noise". Therefore, Cooper et al's system is fully capable to remove other periodic noise produced by connectors and splicers et al. And the wideband noise can be removed by gating the noise out of the electrical signals too (Figure 8, [0077]).

Cooper et al also discloses the noise reduction system performs a frequency analysis of the electrical signals and removes the periodic noise from the electrical signals by gating the periodic noise out of the electrical signals (Figure 13, page 8, [0091], "Each of these high-speed electrical pulses will now contain the wavelength information of their respective sensor grating 30A to 30N. These pulses are then passed to the electronic gating unit 142 where the pulses from the different sensors are isolated and measured for their wavelength information in a similar manner to the gating action performed on the optical signal in unit 20 except now performed electronically instead of optically. The signal from the reference detector is relayed to the electronic gating unit 142 through path 146 to serve as a timing reference").

Although Cooper et al does not expressly disclose that the periodic noise from the noise producing element is removed using frequency based gating. The time and frequency are a complimentary pair; $h(t)$ in time domain and $H(f)$ in frequency domain are two different representations of the same function. One can go back and forth between these two representations by means of the Fourier transform. That is, if the

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noise can be gated out in time domain, it also can be gated out in the frequency domain.

With regard to items (A)-(E), the frequency based gating is well known in the art. To perform a frequency analysis, such as a Fourier analysis (item B), and identify periodic noise by identifying a rapidly varying signal from the frequency analysis (item E) on an electrical signal is well known and widely used method in the art. Wang et al discloses a system and method that uses Fast Fourier Transform technique to analyze the periodic noise of an electrical signal, the noise reduction system performs a frequency analysis of the electrical signals to identify periodic noise and the periodic noise from said noise producing element is removed using frequency based gating (Abstract, Figures 2 and 3, Methods of Interference Eliminated); wherein the frequency based gating comprises of selecting a bandwidth where periodic noise has been identified and removing the bandwidth from the electrical signals (Digital Filtering Technique, FFT Threshold Digital Filter and Multi-Band-Pass Digital Filter, a multi-band rejection digital filter is used to remove the noise components); and the system identifies periodic noise by identifying a rapidly varying signal from the frequency analysis (Figures 2 and 3, and Digital Filtering Technique).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the frequency analysis and noise gating as taught by Wang et al to the system of Davis and Cooper et al so that the noise can be efficiently identified and removed or gated out of the electrical signals in frequency domain, and measurement accuracy can be enhanced.

2). With regard to claim 8, Davis et al and Cooper et al and Wang et al disclose all of the subject matter as applied to claim 1 above. And Davis et al further discloses wherein the optical filter element includes a fiber Bragg grating (FBG 16 or 18 in Figure 1B).

3). With regard to claim 9, Davis et al and Cooper et al and Wang et al disclose all of the subject matter as applied to claim 1 above. And Davis further discloses wherein the optical waveguide includes a discontinuity (connectors, splicers or imperfections in the FBG itself, column 1 line 40-41).

4). With regard to claim 10, Davis et al and Cooper et al and Wang et al disclose all of the subject matter as applied to claim 1 above. And Davis further discloses wherein the discontinuity is a splice (splicers, column 1 line 40-41).

5). With regard to claims 11, 14, 26 and 31, Davis discloses a sensor comprising:
a source for producing optical signals (BROADBAND SOURCE 12 in Figure 2B);
an optical waveguide (Form the coupler 14 to FBG 18 in Figure 2B) having a noise producing element (connectors, splicers or imperfections in the FBG itself, column 1 line 40-41) and an optical filter element (the FBG 16 or 18 in Figure 2B);

a receiver (20 in Figure 2B) for converting applied optical signals into amplified electrical signals;

a coupler (14 in Figure 2B) for coupling said produced optical signals into said optical waveguide and for coupling reflections from said optical waveguide as applied optical signals to said receiver (column 3 line 59-64); and

a signal processor (the combination of 32 and 34 in Figure 2B) for removing noise produced by said noise producing element from said electrical signals.

Davis uses spectral analysis to analysis noise (32 and 34 in Figure 2B, and Figure 3 and 4). and a variable threshold is used to remove the background noise; and removing noise includes performing a frequency analysis (34 in Figure 2B is the spectral analysis device).

But Davis does not expressly disclose (A) wherein a periodic noise from said noise producing element is removed using frequency based gating; (B) wherein the frequency analysis is a Fourier analysis (claim 14); and (C) wherein the signal processor identifies periodic noise by identifying a rapidly varying signal from the frequency analysis (claim 26); (D) the signal processor performs a frequency analysis of the electrical signals to identify and remove periodic noise from the electrical signal (claim 31).

With regard to items (B) - (C), however, Cooper et al discloses a system in which the noise reduction system (20 in Figure 2 and 7) performs a frequency analysis (a standard optical spectrum analyzer, [0071]) of the received signals to identify and further removes the noise from the optical signals. Cooper et al uses the frequency analysis and gating method to obtain a specific frequency and remove unwanted other frequency (Figure 4A – Figure 4C, [0071]). Although Cooper et al does not expressly state that the other frequency (e.g. the peak just on the left side of the 1553.4 nm in Figure 4A, which is shown in Figure 4C) is a “periodic noise”, that peak is indeed a “noise” relative to the specific frequency component 1553.4 nm which is shown in

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Figure 4B; and since this "noise" is generated by another FBG, it is indeed a "periodic noise". Therefore, Cooper et al's system is fully capable to remove other periodic noise produced by connectors and splicers et al. And the wideband noise can be removed by gating the noise out of the electrical signals too (Figure 8, [0077]).

Cooper et al also discloses the noise reduction system performs a frequency analysis of the electrical signals and removes the periodic noise from the electrical signals by gating the periodic noise out of the electrical signals (Figure 13, page 8, [0091], "Each of these high-speed electrical pulses will now contain the wavelength information of their respective sensor grating 30A to 30N. These pulses are then passed to the electronic gating unit 142 where the pulses from the different sensors are isolated and measured for their wavelength information in a similar manner to the gating action performed on the optical signal in unit 20 except now performed electronically instead of optically. The signal from the reference detector is relayed to the electronic gating unit 142 through path 146 to serve as a timing reference").

Although Cooper et al does not expressly disclose that the periodic noise from the noise producing element is removed using frequency based gating. The time and frequency are a complimentary pair; $h(t)$ in time domain and $H(f)$ in frequency domain are two different representations of the same function. One can go back and forth between these two representations by means of the Fourier transform. That is, if the noise can be gated out in time domain, it also can be gated out in the frequency domain.

With regard to items (A)-(E), the frequency based gating is well known in the art. To perform a frequency analysis, such as a Fourier analysis (item B) and identify periodic noise by identifying a rapidly varying signal from the frequency analysis (item C) on an electrical signal is well known and widely used method in the art. Wang et al discloses a system and method that uses Fast Fourier Transform technique to analyze the periodic noise of an electrical signal; the noise reduction system performs a frequency analysis of the electrical signals to identify periodic noise and the periodic noise from said noise producing element is removed using frequency based gating (Abstract, Figures 2 and 3, Methods of Interference Eliminated); and the signal processor identifies periodic noise by identifying a rapidly varying signal from the frequency analysis (Figures 2 and 3, and Digital Filtering Technique).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the frequency analysis and noise gating as taught by Wang et al to the system of Davis and Cooper et al so that the noise can be efficiently identified and removed or gated out of the electrical signals in frequency domain, and measurement accuracy can be enhanced.

6). With regard to claim 18, Davis et al and Cooper et al and Wang et al disclose all of the subject matter as applied to claim 11 above. And Davis et al further discloses wherein the optical filter element includes a fiber Bragg grating (FBG 16 or 18 in Figure 1B).

7). With regard to claim 19, Davis et al and Cooper et al and Wang et al disclose all of the subject matter as applied to claim 11 above. And Davis et al further discloses

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wherein the optical waveguide includes a discontinuity (connectors, splicers or imperfections in the FBG itself, column 1 line 40-41).

8). With regard to claim 20, Davis et al and Cooper et al and Wang et al disclose all of the subject matter as applied to claim 1 above. And Davis et al further discloses wherein the discontinuity is a splice (splicers, column 1 line 40-41).

9). With regard to claims 21 and 27, Davis discloses a method of compensating for optical reflection comprising:

producing an optical signal (BROADBAND SOURCE 12 in Figure 2B);

coupling (14 in Figure 2B) the optical signal into an optical waveguide having a noise producing element and an optical filter element;

converting (20 in Figure 2B) reflections along the optical waveguide into electrical signals; and

removing noise (the combination of 32 and 34 in Figure 2B) produced by the noise producing element from the electrical signals such that the electrical signals from the optical filter element are retained (column 4 line 16-67).

Davis uses spectral analysis to analyze the noise (32 and 34 in Figure 2B, and Figure 3 and 4) and a variable threshold is used to remove the background noise; and removing noise includes performing a frequency analysis (34 in Figure 2B is the spectral analysis device).

But Davis does not expressly disclose that (A) wherein gating out the periodic noise produced by the noise producing element from the electrical signals includes frequency based gating; and (B) wherein gating out the periodic noise comprises

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removing a rapid varying signal from a frequency analysis of the electrical signals (claim 27).

However, Cooper et al discloses a system in which the noise reduction system (20 in Figure 2 and 7) performs a frequency analysis (a standard optical spectrum analyzer, [0071]) of the received signals to identify and further removes the noise from the optical signals. Cooper et al uses the frequency analysis and gating method to obtain a specific frequency and remove unwanted other frequency (Figure 4A – Figure 4C, [0071]). Although Cooper et al does not expressly state that the other frequency (e.g. the peak just on the left side of the 1553.4 nm in Figure 4A, which is shown in Figure 4C) is a “periodic noise”, that peak is indeed a “noise” relative to the specific frequency component 1553.4 nm which is shown in Figure 4B; and since this “noise” is generated by another FBG, it is indeed a “periodic noise”. Therefore, Cooper et al’s system is fully capable to remove other periodic noise produced by connectors and splicers et al. And the wideband noise can be removed by gating the noise out of the electrical signals too (Figure 8, [0077]).

Cooper et al also discloses the noise reduction system performs a frequency analysis of the electrical signals and removes the periodic noise from the electrical signals by gating the periodic noise out of the electrical signals (Figure 13, page 8, [0091], “Each of these high-speed electrical pulses will now contain the wavelength information of their respective sensor grating 30A to 30N. These pulses are then passed to the electronic gating unit 142 where the pulses from the different sensors are isolated and measured for their wavelength information in a similar manner to the gating action.

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performed on the optical signal in unit 20 except now performed electronically instead of optically. The signal from the reference detector is relayed to the electronic gating unit 142 through path 146 to serve as a timing reference”).

Although Cooper et al does not expressly disclose that the periodic noise from the noise producing element is removed using frequency based gating. The time and frequency are a complimentary pair; $h(t)$ in time domain and $H(f)$ in frequency domain are two different representations of the same function. One can go back and forth between these two representations by means of the Fourier transform. That is, if the noise can be gated out in time domain, it also can be gated out in the frequency domain.

The frequency based gating is well known in the art. To perform a frequency analysis, such as a Fourier analysis, on an electrical signal and gate out the periodic noise comprises removing a rapid varying signal from the frequency analysis is well known and widely used method in the art. Wang et al discloses a system and method that uses Fast Fourier Transform technique to analyze the periodic noise of an electrical signal and remove the periodic noise from the electrical signals (Abstract, Methods of Interference Eliminated); and the gating out the periodic noise comprises removing a rapid varying signal from the frequency analysis (Figures 2 and 3, and Digital Filtering Technique).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the frequency analysis and noise gating as taught by Cooper et al and Wang et al to the system of Davis so that the noise can be

efficiently identified and removed or gated out of the electrical signals, and measurement accuracy can be enhanced.

5. Claims 2, 12, 22, 32 and 33 (the original misnumbered claims 33 and 34) are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis et al (US 6,346,702) and Cooper et al (US 2002/0025097) and Wang et al (Wang et al: "Analysis and Suppression of Continuous Periodic Interference for On-Line PD Monitoring of Power Transformers", High Voltage Engineering Symposium, 22-27 August 1999, 5.212.P5) as applied to claims 1, 11, 21 and 22 above, and in further view of Keown (US 4,143,350).

1). With regard to claims 2, 12, 22 and 32, Davis et al and Cooper et al and Wang et al discloses all of the subject matter as applied to claims 1, 11 and 21 above. And Davis teaches that the "variable threshold peak detection unit 32 determines the DC component of the background signal by performing two running averages along the spectral trace. ... The local threshold value includes an overall minimum level term which is comparable to the noise level of the variable threshold peak detection unit 32". But Davis does not explicitly state wherein the noise reduction system or signal processor averages broadband noise and then subtracts the averaged level from the electrical signals.

However, the method of averaging the broadband noise and then subtracting the averaged level from the electrical signals is a well known method and widely used in the signal processing, such method is used by Keown to remove the background noise (ABSTRACT and column 6, line 6-15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the method of averaging noise taught by Keown to the system of Davis et al and Cooper et al and Wang et al so that the broadband noise can be effectively suppressed and system performance is enhanced.

2). With regard to claim 33, Davis et al and Cooper et al and Wang et al and Keown discloses all of the subject matter as applied to claims 21 and 22 above. And Davis et al and Cooper et al and Wang et al further teach wherein gating out the periodic noise comprises removing a rapid varying signal from a frequency analysis of the electrical signals (Wang et al: Figures 2 and 3, and Digital Filtering Technique).

6. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis et al (US 6,346,702) and Cooper et al (US 2002/0025097) and Wang et al (Wang et al: "Analysis and Suppression of Continuous Periodic Interference for On-Line PD Monitoring of Power Transformers", High Voltage Engineering Symposium, 22-27 August 1999, 5.212.P5) as applied to claim 11 above, and in further view of Kringlebotn (US 6,097,487).

Davis et al discloses all of the subject matter as applied to claim 11 above. And Davis et al discloses a broadband source. But Davis does not disclose that the source includes a tunable laser (claim 16); and the source includes a broadband light source and a tunable filter (claim 17).

However, Kringlebotn et al, in the same field endeavor, discloses a tunable laser or a broadband light source and a tunable filter (1 and 2 in Figure 1, Figure 4 and 6, column 2 line 62-67). By using a tunable filter, a fixed F-P filter, and a reference

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wavelength FBG, Kringlebotn et al constructs either a spectrum analyser with a high degree of wavelength accuracy, or a control system for a tunable laser or a multi-wavelength laser array to be able to control and set the wavelength of the tunable laser/wavelengths of the laser array with a high degree of repeatability and accuracy, typically <1 pm.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a tunable laser or a broadband light source with a tunable filter taught by Kringlebotn et al to the system of Davis et al so that an accurate frequency/wavelength scale can be obtained and system performance can be enhanced.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li Liu whose telephone number is (571)270-1084. The examiner can normally be reached on Mon-Fri, 8:00 am - 5:30 pm, alternating Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Li Liu
August 13, 2007


KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER